



22095511



International Baccalaureate®
Baccalauréat International
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**INFORMATION TECHNOLOGY IN A GLOBAL SOCIETY
HIGHER LEVEL AND STANDARD LEVEL
PAPER 1**

Thursday 14 May 2009 (afternoon)

1 hour

Candidate session number

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INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Answer all the questions in the spaces provided.



1. A spreadsheet is used to calculate the cost of carpeting a house. It is shown here with the formula view switched on so that you can see how it is constructed.

	A	B	C	D
1	Room	Type of carpet	Area of room (sq m)	Net cost (£)
2	Bedroom 1	Wool/Nylon Twist	20	=VLOOKUP(B2,\$A\$17:\$B\$21,2)*C2
3	Bedroom 2	Wool/Nylon Twist	15	=VLOOKUP(B3,\$A\$17:\$B\$21,2)*C3
4	Bedroom 3	Wool/Nylon Twist	15	=VLOOKUP(B4,\$A\$17:\$B\$21,2)*C4
5	Lounge	100% Wool Plush	30	=VLOOKUP(B5,\$A\$17:\$B\$21,2)*C5
6	Dining Room	100% Wool Frieze	20	=VLOOKUP(B6,\$A\$17:\$B\$21,2)*C6
7	Hall	Sculptured Saxony	20	=VLOOKUP(B7,\$A\$17:\$B\$21,2)*C7
8	Stairway	Sculptured Saxony	25	=VLOOKUP(B8,\$A\$17:\$B\$21,2)*C8
9	Landing	Sculptured Saxony	10	=VLOOKUP(B9,\$A\$17:\$B\$21,2)*C9
10	Bathroom	Nylon	10	=VLOOKUP(B10,\$A\$17:\$B\$21,2)*C10
11				
12	Total (without tax)			=SUM(D2:D10)
13	Tax			=D12*\$B\$23
14	Total (tax included)			=D12+D13
15				
16	Carpet Type	Cost per sq m		
17	100% Wool Frieze	36		
18	100% Wool Plush	35		
19	Nylon	15		
20	Sculptured Saxony	30		
21	Wool/Nylon Twist	32		
22				
23	Tax rate	0.175		
24				

- (a) Identify the **two** functions used in this spreadsheet.

[2 marks]

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- (b) (i) Cell D12 contains the expression (D2:D10). Describe the meaning of the information in this expression.

[2 marks]

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(Question 1(b) continued)

- (ii) Cell D13 contains an absolute and a relative cell reference. Define the term *absolute cell reference*.

[2 marks]

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- (c) Explain how features of a spreadsheet can be used in order to investigate “what-if” questions.

[4 marks]

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2. One way to make money from a web site is to place advertisements on it. One web search engine company allows the web site owner to add some HTML code to the web site, which searches the site for content and delivers advertisements relevant to that site. When a visitor to the web site clicks on a link to an advertisement, the web site owner earns a small fee. The more visitors there are to the site the more chance the owner will make money from the advertisements displayed on the site.



The screenshot shows the 'TECH BLOG' website. The header includes the site name, 'LATEST TECH & GADGET NEWS', and navigation links: CONTACT, ADVERTISE, SHOPPING, and FORUMS. A main article titled 'Soul Calibur 4 "Characters and Online" Interview' is dated 09/29/2007, posted by staff, and has no comments. To the right, there are search bars for the blog and its archives. Below the article is a large image of a game scene. On the right side, there are two advertisements: one for 'Mercedes Sports Cars' and another for 'Cleanroom' services. A speech bubble points to these ads with the label 'advertisements'.

[Source: <http://www.techeblog.com> (30 September 2007). Reprinted with the permission of Honekai Media.]

- (a) HTTP stands for Hyper Text Transfer Protocol. Define the term *protocol* in this context.

[2 marks]

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(Question 2 continued)

- (b) Describe how the search engine determines relevant advertisements to display on this or other web sites.

[4 marks]

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- (c) Explain **two** ways in which the number of visitors to this or other web sites can be increased.

[4 marks]

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3. The *Oyster* card is an electronic ticket that is used in London to pay for travel on trains run by *Transport for London*. It contains an RFID (Radio Frequency Identification) system and it can be charged with money. The amount of credit on the card is stored in the RFID chip on the card. Money is deducted each time a journey is made.



[Source: http://farm1.static.flickr.com/108/261801209_49ff0f1589.jpg, 30 September 2007]

When entering an underground station the card is identified by being touched on the card reader so the RFID signal is detected. On leaving the station at the end of the journey the cost of the fare is deducted from the card. People are encouraged to use *Oyster* cards by making the fares much cheaper when using the card than buying a paper ticket. Also, there is a price “cap” which means that the user will never pay more than a maximum amount each day. If the card balance is too low, access to the trains is denied.

It is possible to register the card online. This allows the user to top it up with money and to view a journey history, like the one below.

Date	Time	Location	Action	Balance
23/01/07	15:03	Russell Square	Top-up	£21.00
	15:03	Russell Square	Entry	
	15:17	Oxford Circus	Exit	£19.50
	18:49	Russell Square	Entry	
	19:09	South Kensington	Exit	£17.00
24/01/07	08:42	Russell Square	Entry	
	08:52	Euston Square	Exit	£12.40

- (a) The RFID readers have a short range of 0-8 centimetres. Identify **two** reasons why the range needs to be short.

[2 marks]

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(Question 3 continued)

- (b) Identify **four** possible tasks the *Oyster* software would need to perform when an *Oyster* card is used at a station.

[4 marks]

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- (c) Explain **one** benefit and **one** drawback of extending the use of the *Oyster* card nationally.

[4 marks]

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4. The following is a poem submitted as part of a response to an English assignment:

i am the sun sets, i let the
power of imagining through like a
tear in the minds eye death is
still death shall on the peaks
within the skies, unfolds before
you can call my name to inform
me of what we've done.

[Source: <http://www.elsewhere.org/hbzpoetry/>. Reprinted with permission.]

This poem was generated by a computer using artificial intelligence.

- (a) Define the term *artificial intelligence*.

[2 marks]

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- (b) Describe how tests can be used to determine whether a computer system is an example of artificial intelligence.

[4 marks]

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(Question 4 continued)

- (c) The teacher marking this assignment was suspicious that the poem was not the student’s work. The student admitted that it was generated by a computer. Explain how a computer program could have generated this poem.

[4 marks]

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